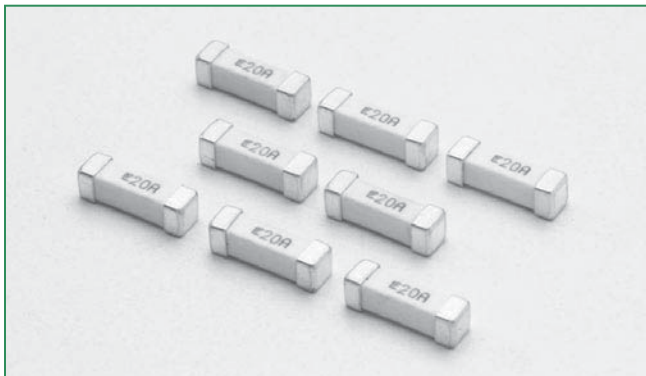


### RoHS HF 456 Series Fuse



#### Description

The High Current NANO<sup>2®</sup> Fuse is a small square surface mount fuse that is designed to support higher current requirements of various applications.

#### Features

- Surface mount high current fuse
- Fully compatible with lead-free solder alloys and higher temperature profiles associated with lead-free assembly
- RoHS compliant and Halogen Free
- Available in ratings of 20 to 40 Amperes

#### Applications

- Voltage regulator module for PC server
- Cooling fan system for PC server
- Storage system power
- Basestation power supply
- Automotive

#### Agency Approvals

| AGENCY | AGENCY FILE NUMBER | AMPERE RATING |
|--------|--------------------|---------------|
|        | E10480             | 20A, 30A, 40A |
|        | NBK030308-JP1021   | 20A, 30A      |

#### Electrical Characteristics

| % of Ampere Rating | Opening Time        |
|--------------------|---------------------|
| 100%               | 4 hours, Minimum    |
| 200%               | 60 seconds, Maximum |

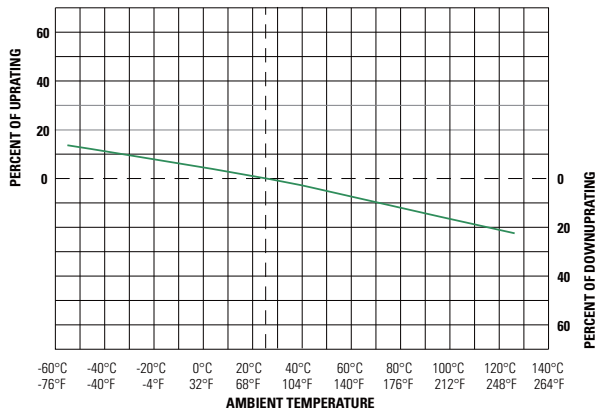
#### Electrical Specifications

| Ampere Rating (A) | Amp Code | Max Voltage Rating (V) | Interrupting Rating                                                                | Nominal Cold Resistance (Ohms) | Nominal Melting I <sup>2</sup> t (A <sup>2</sup> Sec.) | Nom Voltage Drop (mV) | Agency Approvals |   |
|-------------------|----------|------------------------|------------------------------------------------------------------------------------|--------------------------------|--------------------------------------------------------|-----------------------|------------------|---|
|                   |          |                        |                                                                                    |                                |                                                        |                       |                  |   |
| 20                | 020.     | 125                    | 100A @125V AC<br>300A @ 65V AC<br>300A @ 100V DC<br>1000A @ 32V DC<br>500A @ 72VDC | 0.00230                        | 18                                                     | 64.7                  | x                | x |
| 30                | 030.     | 125                    | 100A @ 125V AC<br>300A @ 65V AC<br>1000A @ 32V DC<br>500A @ 72VDC                  | 0.00132                        | 81                                                     | 69.9                  | x                | x |
| 40                | 040.     | 60                     | 600A @ 60V DC                                                                      | 0.00105                        | 454                                                    | 55                    | x                |   |

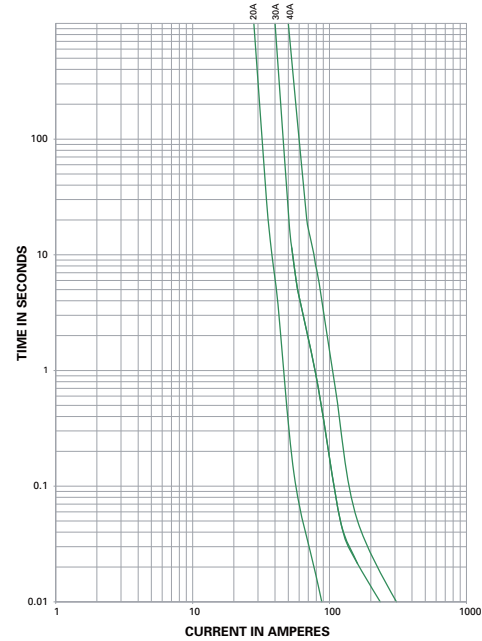
#### Notes:

1. Cold resistance measured at less than 10% of rated current at 23°C.
2. Agency Approval Table Key: X=Approved or Certified, P=Pending.
3. I<sup>2</sup>t values stated for 10 msec opening time.

### Temperature Derating Curve

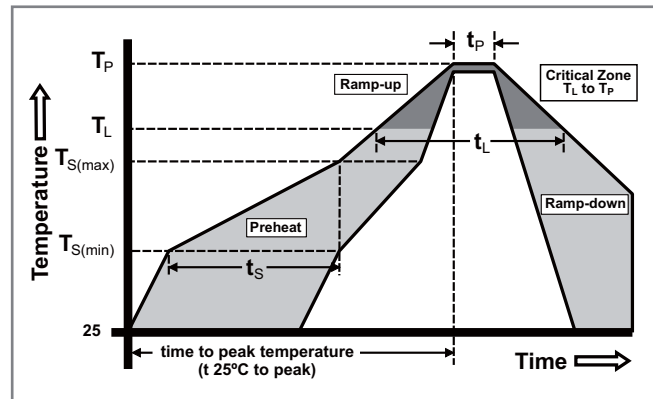


### Average Time Current Curves



### Soldering Parameters – Reflow Soldering

|                                                        |                                    |                         |
|--------------------------------------------------------|------------------------------------|-------------------------|
| Reflow Condition                                       |                                    | Pb – Free assembly      |
| Pre Heat                                               | - Temperature Min ( $T_{s(min)}$ ) | 150°C                   |
|                                                        | - Temperature Max ( $T_{s(max)}$ ) | 200°C                   |
|                                                        | - Time (Min to Max) ( $t_s$ )      | 60 – 180 secs           |
| Average ramp up rate (Liquidus Temp ( $T_L$ ) to peak) |                                    | 5°C/second max.         |
| $T_{s(max)}$ to $T_L$ - Ramp-up Rate                   |                                    | 5°C/second max.         |
| Reflow                                                 | - Temperature ( $T_L$ ) (Liquidus) | 217°C                   |
|                                                        | - Temperature ( $t_L$ )            | 60 – 150 seconds        |
| Peak Temperature ( $T_p$ )                             |                                    | 250 <sup>+0/-5</sup> °C |
| Time within 5°C of actual peak Temperature ( $t_p$ )   |                                    | 20 – 40 seconds         |
| Ramp-down Rate                                         |                                    | 5°C/second max.         |
| Time 25°C to peak Temperature ( $T_p$ )                |                                    | 8 minutes max.          |
| Do not exceed                                          |                                    | 260°C                   |



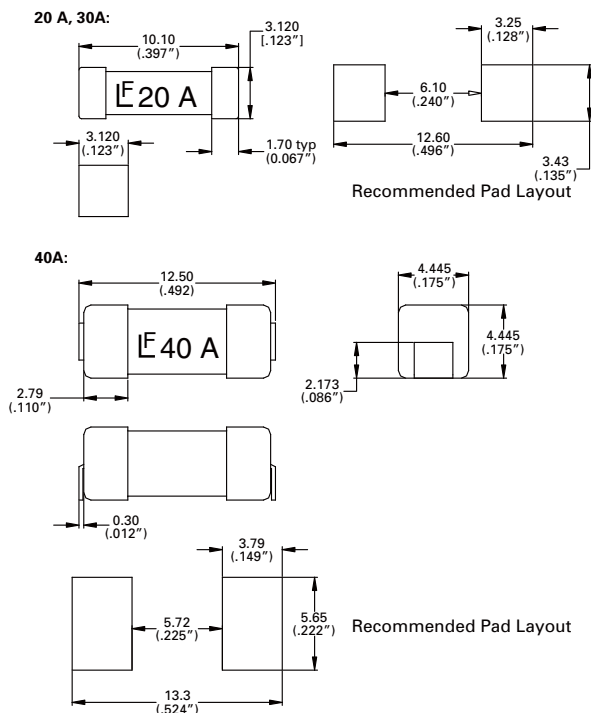
## Product Characteristics

|                                                  |                                                                                                                                                                                                                                                                                              |
|--------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Materials</b>                                 | Body: Ceramic<br>Cap: Silver Plated Brass                                                                                                                                                                                                                                                    |
| <b>Product Marking</b>                           | Body: Brand Logo, Current Rating                                                                                                                                                                                                                                                             |
| <b>Insulation Resistance</b>                     | MIL-STD-202, method 302, Test Condition A (10,000 ohms, Minimum)                                                                                                                                                                                                                             |
| <b>Solderability</b>                             | MIL-STD-202, Method 208                                                                                                                                                                                                                                                                      |
| <b>Resistance to Soldering Heat</b>              | MIL-STD-202, Method 210, Test Condition B (10 sec at 260°C)                                                                                                                                                                                                                                  |
| <b>PCB Recommendation for Thermal Management</b> | Min. copper layer thickness = 100µm<br>Min. copper trace width = 20A, 30 10mm (20A, 30A) / 15mm (40A)<br>Alternate methods of thermal management may be used. In such cases, under normal operations, the maximum temperature of the fuse body should not exceed 80°C in a 25°C environment. |

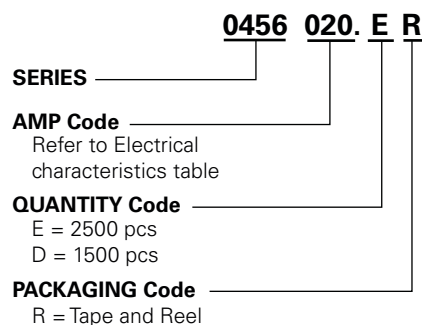
|                                   |                                                                             |
|-----------------------------------|-----------------------------------------------------------------------------|
| <b>Operating Temperature</b>      | -55°C to 125°C with proper derating                                         |
| <b>Thermal Shock</b>              | MIL-STD-202F, Method 107G, Test Condition B (5 cycles -65°C to 125°C)       |
| <b>Vibration</b>                  | MIL-STD-202F, Method 201A (10-55 Hz)                                        |
| <b>Moisture Sensitivity Level</b> | Level 1 J-STD-020C                                                          |
| <b>Moisture Resistance</b>        | MIL-STD-202F Method 106, High Humidity (90-98% RH), Heat (65°C)             |
| <b>Salt Spray</b>                 | MIL-STD-202F, Method 101D, Test Condition B                                 |
| <b>Mechanical Shock</b>           | MIL-STD-202, Method 213, Test Condition I (100 G's peak for 6 milliseconds) |

456 Series

## Dimensions



## Part Numbering System



## Packaging

| Rating   | Packaging Option    | Packaging Specification        | Quantity | Quantity & Packaging Code |
|----------|---------------------|--------------------------------|----------|---------------------------|
| 20A, 30A | 24 mm Tape and Reel | EIA RS-481-2                   | 2500     | ER                        |
| 40A      | 24 mm Tape and Reel | EIA RS-481-2 (IEC 286, part 3) | 1500     | DR                        |



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